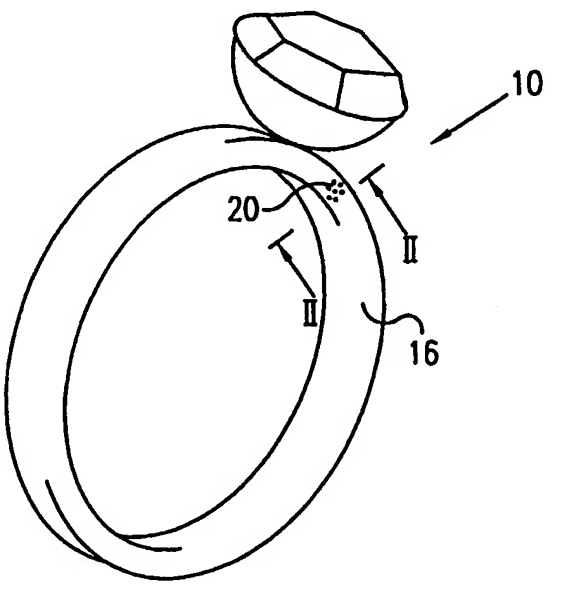


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(21) International Application Number: PCT/IL00/00253 (22) International Filing Date: 3 May 2000 (03.05.00) (30) Priority Data: 09/304,853 5 May 1999 (05.05.99) US 09/407,977 29 September 1999 (29.09.99) US (71) Applicant (for all designated States except US): T.I.D. (IDENTIFYING DIAMOND) LIMITED [CY/CY]; c/o Phoebe Christodoulou Law Office, Vyronos Avenue, P. Lordos Center, 1st floor, Office 105, 3036 Limassol (CY). (72) Inventor; and (75) Inventor/Applicant (for US only): REGEV, Eyal [IL/IL]; 63 Hahoresch Street, 46910 Kfar Shmaryahu (IL). (74) Agents: COLB, Sanford, T. et al.; Sanford, T. Colb & Co., P.O. Box 2273, 76122 Rehovot (IL).			(81) Designated States: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.
(54) Title: IDENTIFICATION DEVICE			
(57) Abstract <p>An identification device (30) including a gem (32) having detectable identification data (34) formed thereon mountable on an object, the identification data (34) being related to an identifying feature of the object. A jewelry piece (10) is also disclosed that includes a jewelry substrate (16) having a recess (18) formed therein, and an identification device (20), having detectable identification data (22) formed thereon, disposed in the recess (18).</p>			
			

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IDENTIFICATION DEVICE

FIELD OF THE INVENTION

The present invention relates generally to apparatus for identification of objects, and particularly to a gem used as an identification device to identify another object, as well as to a piece of jewelry with an identification device disposed therein.

BACKGROUND OF THE INVENTION

A large amount of jewelry is manufactured and sold around the world every year. As is well known, there is unfortunately a large amount of jewelry theft as well. Thus the importance of jewelry identification is clearly understood. By being able to identify a piece of jewelry, it may be possible to return lost or stolen jewelry to the rightful owner. In addition, many large jewelry stores offer repair services at little or no cost to purchasers of jewelry. Unfortunately, unscrupulous persons often try to cheat the store by bringing jewelry for repair which was not purchased at the store and which does not have a repair guarantee. Again, the ability to identify jewelry can prevent such costly cheating.

Apparatus and methods for identification of jewelry are well known. For example, identification information data may be etched, engraved or otherwise marked on a jewel to be identified. The identification information data may be related to dimensions, weight or material of the jewelry piece, purchase location and date, period of repair guarantee, and name and address of a purchaser or manufacturer, for example.

US Patent 5,379,102 to Takeuchi, describes a system for identifying jewels including an automatic microscope, automatic image-analyzing apparatus, electric-resistance measuring apparatus, weighing apparatus, spectroscopic-analysis apparatus, and electronic information processing apparatus. The microscope forms an enlarged image of an identification number marked on a jewel to be identified. The image-analyzing apparatus receives the image of the identification number from the microscope and analyzes it. Additional identification information data is measured and processed, including electrical resistance between two reference points on the jewel, specific gravity of the jewel, and spectrum of reflected light from the jewel. The identification mark may be photo-etched on the jewel.

Other US Patents which deal generally with jewel identification include 1,700,497 to Heitzler, 1,799,604 to Read, 3,740,142 to Takubo, 3,947,120 to Bar-Issac et al., 4,012,141 to Hanneman, 4,125,770 to Lang, 4,200,506 to Dreschhoff et al., 4,316,385 to DeVries et al., 4,467,172 to Ehrenwald et al., 4,799,786 to Gerrard, 4,900,147 to Bowley et

al., 5,118,181 to Yifrach et al., 5,124,935 to Wallner et al., 5,410,125 to Winston et al., 5,485,312 to Horner et al., and 5,828,405 to Vanier et al.

It is important to note that all of the above patents deal with identifying the gem itself.

5

SUMMARY OF THE INVENTION

It is an object of the present invention to provide novel methods and apparatus for identification of jewelry.

It is another object of the present invention to provide novel apparatus for identification of objects, wherein a gem is used as an identification device not to identify itself but rather to identify another object. The gem is marked with identification information data by means of laser etching, photo-etching, inscribing or any other suitable marking method. The markings may be on any portion of the gem, such as the facets, crown or table, for example. The identification information data may be related to dimensions, weight or material of the object to be identified, and the gem is set in some part of the object to be identified. The gem may or may not be hidden from view.

It is noted that throughout the specification and claims the term gem encompasses any precious or semiprecious stone or ornament, natural or synthetic. The terms gem, jewel and precious stone are used interchangeably.

There is thus provided in accordance with a preferred embodiment of the present invention an identification device including a gem having detectable identification data formed thereon mountable on an object, the identification data being related to an identifying feature of the object.

In accordance with a preferred embodiment of the present invention the identification data are optically detectable, such as a bar code.

Further in accordance with a preferred embodiment of the present invention the identification data are magnetically detectable.

There is also provided in accordance with a preferred embodiment of the present invention a method for identification of an object, including providing an object to be identified, forming detectable identification data on a gem, the identification data being related to an identifying feature of the object, and mounting the gem on the object.

In accordance with a preferred embodiment of the present invention the step of forming identification data includes recording data related to at least one of the following data: dimensions of the object, weight of the object, material of the object, purchase location,

purchase date, period of repair guarantee, name of a purchaser, address of a purchaser, name of a manufacturer of the object, and address of a manufacturer of the object.

There is also provided in accordance with a preferred embodiment of the present invention a jewelry piece including a jewelry substrate having a recess formed therein, and an identification device, having detectable identification data formed thereon, disposed in the recess.

In accordance with a preferred embodiment of the present invention the identification data are optically detectable.

Further in accordance with a preferred embodiment of the present invention the identification data include a bar code.

Still further in accordance with a preferred embodiment of the present invention the identification data include magnetically recorded data suitable for reading by a magnetic reading device.

In accordance with a preferred embodiment of the present invention the identification device includes an integrated circuit with electrical contacts that are connectable to an electronic readout device.

Further in accordance with a preferred embodiment of the present invention the identification device includes a bead with the identification data formed on an outside surface thereof.

Additionally in accordance with a preferred embodiment of the present invention a seal is provided that seals the identification device in the recess.

There is also provided in accordance with a preferred embodiment of the present invention a method for jewelry identification including providing an identification device, forming detectable identification data on the identification device, forming a recess in a jewelry piece, and placing the identification device in the recess.

In accordance with a preferred embodiment of the present invention the step of forming identification data includes recording data related to at least one of the following data: dimensions of the jewelry piece, weight of the jewelry piece, material of the jewelry piece, purchase location, purchase date, period of repair guarantee, name of a purchaser, address of a purchaser, name of a manufacturer of the jewelry piece, and address of a manufacturer of the jewelry piece.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be understood and appreciated more fully from the following detailed description, taken in conjunction with the drawings in which:

Fig. 1 is a simplified pictorial illustration of a jewelry piece constructed and operative in accordance with a preferred embodiment of the present invention;

5 Fig. 2 is a simplified sectional illustration of the jewelry piece of Fig. 1, taken along lines II-II in Fig. 1, in accordance with a preferred embodiment of the present invention;

Fig. 3 is a simplified sectional illustration of the jewelry piece of Fig. 1, taken along lines II-II in Fig. 1, in accordance with another preferred embodiment of the present invention;

10 Figs. 4A and 4B are simplified top-view and side-view illustrations, respectively, of an identification device constructed and operative in accordance with a preferred embodiment of the present invention; and

Figs. 5-14 are simplified pictorial illustrations of examples of objects in which the identification device of Figs. 4A and 4B is mounted, wherein the objects are as follows:

15 Fig. 5 is a simplified pictorial illustration of a ring;

Fig. 6 is a simplified pictorial illustration of an article of clothing;

Fig. 7 is a simplified pictorial illustration of a timepiece;

Fig. 8 is a simplified pictorial illustration of a writing instrument;

Fig. 9 is a simplified pictorial illustration of eyeglasses;

20 Fig. 10 is a simplified pictorial illustration of a cellular telephone;

Fig. 11 is a simplified pictorial illustration of a key;

Fig. 12 is a simplified pictorial illustration of a weapon;

Fig. 13 is a simplified pictorial illustration of a computer; and

Fig. 14 is a simplified pictorial illustration of a compact device (CD).

25 DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Reference is now made to Figs. 1 and 2 which illustrate a jewelry piece 10 constructed and operative in accordance with a preferred embodiment of the present invention. Jewelry piece 10 is illustrated as a ring. This is, of course, just one example of a piece of jewelry, and it is readily appreciated by the skilled artisan that the present invention can be
30 carried out for any kind of jewelry, jewel, gem or ornament.

Jewelry piece 10 includes a jewelry substrate 16, such as a portion of precious metal, for example, having a recess 18 formed therein (Fig. 2). An identification device 20, having detectable identification data 22 formed thereon, is disposed in recess 18. The

identification data 22 may be in any suitable form, such as, but not limited to, optically detectable data (readable by suitable OCR equipment, for example), a bar code, or magnetically recorded data (suitable for reading by a magnetic reading device).

Identification device 20 may be a bead with the identification data 22 formed on an outside surface thereof. For example, identification device 20 may be a glass sphere with the identification data 22 photo-etched thereupon.

Identification device 20 is preferably fixedly placed in recess 18, either by tightly fitting into recess 18 or by means of bonding therein with an adhesive. In the illustrated embodiment of Fig. 2, recess 18 is generally open to the outside air. Such an embodiment is particularly useful for optically-readable identification data.

Alternatively, as shown in Fig. 3, a seal 24 may be provided which seals identification device 20 in recess 18. Seal 24 may be potting material, an opaque plug (metallic or non-metallic), or a transparent plug, for example.

As a further example, shown also in Fig. 3, identification device 20 may be an integrated circuit with electrical contacts 26 that are connectable to an electronic readout device, the contacts 26 generally passing through seal 24. Such an integrated circuit could be recorded with identification data 22 in the same manner as an IC of a smart card, for example.

The type of identification data 22 may include any pertinent data, such as, but not limited to, dimensions of jewelry piece 10, weight of jewelry piece 10, material of jewelry piece 10, purchase location, purchase date, period of repair guarantee, name of a purchaser, address of a purchaser, name of a manufacturer of jewelry piece 10, and address of a manufacturer of jewelry piece 10.

By providing jewelry piece 10 with identification device 20, the abovementioned problem of the prior art is solved, namely, jewelry piece 10 can be easily identified by readily available identification equipment (such as OCR devices, bar code readers, magnetic reading devices, or smart card readers, for example). Installing identification device 20 in jewelry piece 10 may be done quickly and inexpensively by the jewelry manufacturer or retailer.

Reference is now made to Figs. 4A and 4B which illustrate an identification device 30 constructed and operative in accordance with a preferred embodiment of the present invention. Identification device 30 preferably includes a gem 32 having detectable identification data 34 formed thereon. Identification data 34 are related to an identifying feature of an object on which gem 32 can be mounted. Identification data 34 may be marked on gem 32 by any

suitable method, such as, but not limited to, laser etching, photo-etching or inscribing. Identification data 34 may be on any portion of gem 32, such as the facets, crown or table, for example.

Identification data 34 may be marked by a manufacturer of the object to be identified, and may be related to dimensions, weight or material of the object to be identified, or name or address of the manufacturer, for example. Additionally or alternatively, identification data 34 may be marked by a retail or wholesale seller, and may be related to purchase location or date, period of repair guarantee, and name or address of a purchaser. Identification data 34 may be in any suitable form, such as, but not limited to, optically detectable data (readable by suitable OCR equipment, for example), a bar code, or magnetically recorded and detectable data (suitable for reading by a magnetic reading device).

Reference is now made to Figs. 5-14 which illustrate different examples of objects which can be identified. It is noted that in all these examples, gem 32 may or may not be hidden from view. Fig. 5 illustrates a ring 36 with identification device 30 embedded or set therein. Fig. 6 illustrates an article of clothing 38, such as a sweater, with identification device 30 sewn or bonded therein. Fig. 7 illustrates a timepiece 40, such as a watch, with identification device 30 attached to a strap or face of the watch. Fig. 8 illustrates a writing instrument 42, such as a pen, with identification device 30 attached to an outside surface thereof. Fig. 9 illustrates eyeglasses 44 with identification device 30 attached to a frame thereof. Fig. 10 illustrates a cellular telephone 46 with identification device 30 attached to a portion thereof, such as a portion of the mouthpiece. Fig. 11 illustrates a key 48 with identification device 30 attached to a portion thereof, such as the head of the key. Fig. 12 illustrates a weapon 50, with identification device 30 attached to a handle thereof. Fig. 13 illustrates a computer 52 with identification device 30 attached thereto. Fig. 14 illustrates a compact device (CD) 54 with identification device 30 attached to an inner portion thereof. The identification data 34 may be related not only to the CD 54 but also to the software.

It is readily appreciated that the above are merely some examples of objects which can be identified with identification device 30, and the scope of the invention is not limited to these examples.

It will be appreciated by persons skilled in the art that the present invention is not limited by what has been particularly shown and described hereinabove. Rather the scope of the present invention includes both combinations and subcombinations of the features described hereinabove as well as modifications and variations thereof which would occur to a

person of skill in the art upon reading the foregoing description and which are not in the prior art.

C L A I M S

What is claimed is:

1. An identification device (30) comprising:
a gem (32) having detectable identification data (34) formed thereon mountable
5 on an object (36, 38, 40, 42, 44, 46, 48, 50, 52, 54), said identification data (34) being related to an identifying feature of said object (36, 38, 40, 42, 44, 46, 48, 50, 52, 54).
2. The identification device (30) according to claim 1 and further comprising an object (36, 38, 40, 42, 44, 46, 48, 50, 52, 54) to be identified, said gem (32) being mounted on said object (36, 38, 40, 42, 44, 46, 48, 50, 52, 54).
- 10 3. The identification device (30) according to claim 1 wherein said identification data (34) are optically detectable.
4. The identification device (30) according to claim 1 wherein said identification data (34) comprise a bar code.
5. The identification device (30) according to claim 1 wherein said identification
15 data (34) are magnetically detectable.
6. A method for identification of an object (36, 38, 40, 42, 44, 46, 48, 50, 52, 54), comprising:
providing an object (36, 38, 40, 42, 44, 46, 48, 50, 52, 54) to be identified;
forming detectable identification data (34) on a gem (32), said identification
20 data (34) being related to an identifying feature of said object (36, 38, 40, 42, 44, 46, 48, 50, 52, 54); and
mounting said gem (32) on said object (36, 38, 40, 42, 44, 46, 48, 50, 52, 54).
7. The method according to claim 6 wherein the step of forming identification data (34) comprises recording data related to at least one of the following data: dimensions of the
25 object, weight of the object, material of the object, purchase location, purchase date, period of repair guarantee, name of a purchaser, address of a purchaser, name of a manufacturer of the object, and address of a manufacturer of the object.
8. A jewelry piece (10) comprising:
a jewelry substrate (16) having a recess (18) formed therein; and
30 an identification device (20), having detectable identification data (22) formed thereon, disposed in said recess (18).
9. The jewelry piece (10) according to claim 8 wherein said identification data (22) are optically detectable.

10. The jewelry piece (10) according to claim 8 wherein said identification data (22) comprise a bar code.
11. The jewelry piece (10) according to claim 8 wherein said identification data (22) comprise magnetically recorded data suitable for reading by a magnetic reading device.
- 5 12. The jewelry piece (10) according to claim 8 wherein said identification device (20) comprises an integrated circuit with electrical contacts (26) that are connectable to an electronic readout device.
13. The jewelry piece (10) according to claim 8 wherein said identification device (20) comprises a bead with said identification data (22) formed on an outside surface thereof.
- 10 14. The jewelry piece (10) according to claim 8 further comprising a seal (24) which seals said identification device (20) in said recess (18).
15. A method for jewelry identification comprising:
providing an identification device (20);
forming detectable identification data (22) on said identification device (20);
15 forming a recess (18) in a jewelry piece (10); and
placing said identification device (20) in said recess (18).
16. The method according to claim 15 wherein the step of forming identification data (22) comprises recording data related to at least one of the following data: dimensions of the jewelry piece (10), weight of the jewelry piece (10), material of the jewelry piece (10),
20 purchase location, purchase date, period of repair guarantee, name of a purchaser, address of a purchaser, name of a manufacturer of the jewelry piece (10), and address of a manufacturer of the jewelry piece (10).

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FIG. 1

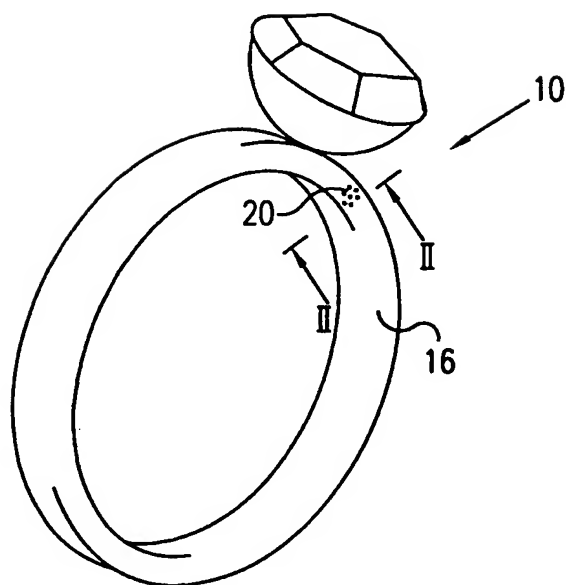


FIG. 2

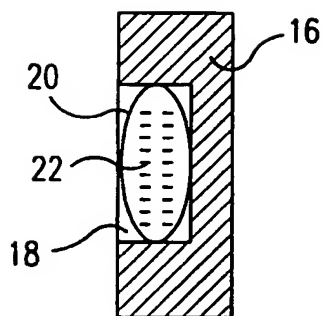
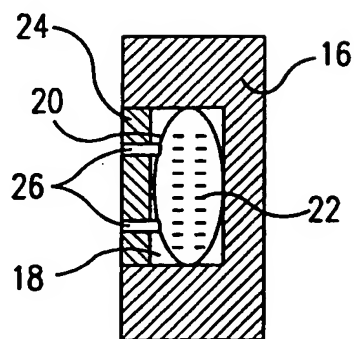


FIG. 3



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FIG. 4A

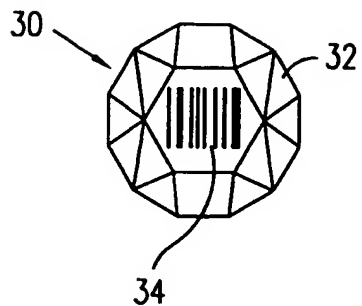


FIG. 4B

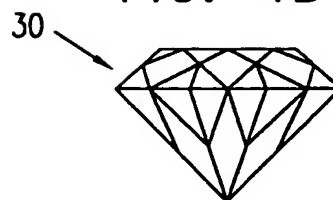


FIG. 5

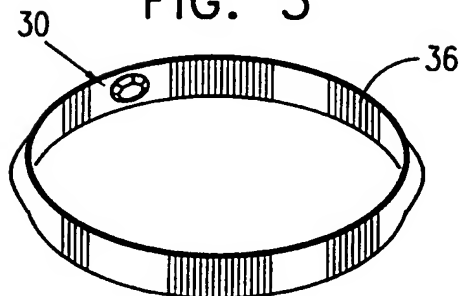


FIG. 6

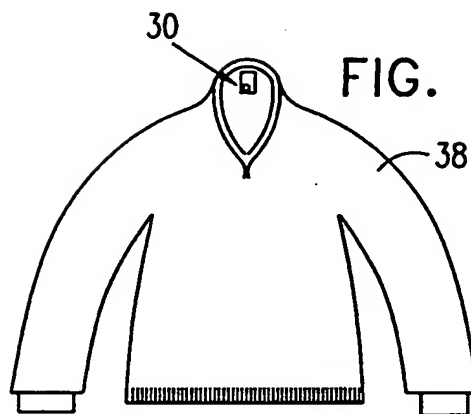


FIG. 7

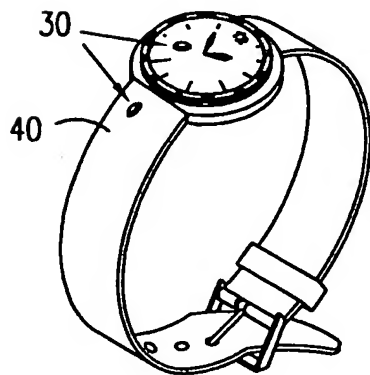


FIG. 8

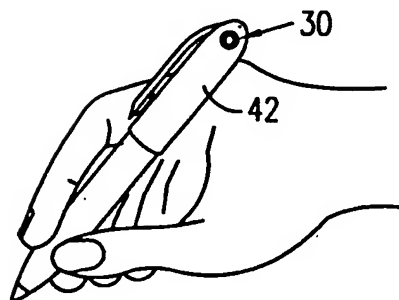
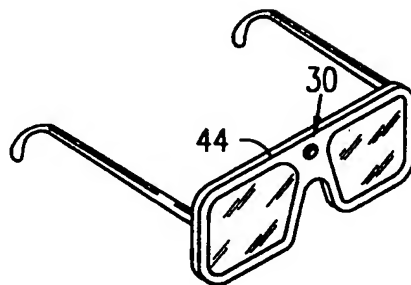


FIG. 9



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FIG. 10

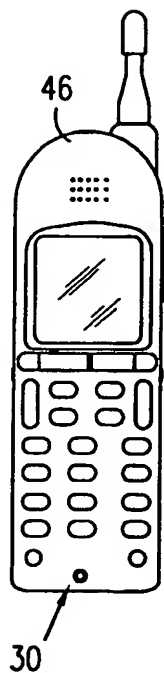


FIG. 11

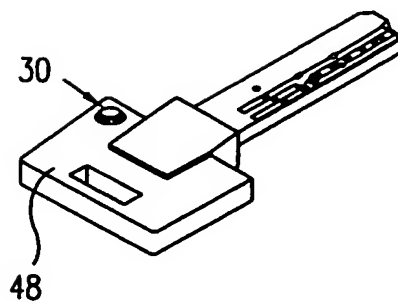


FIG. 12

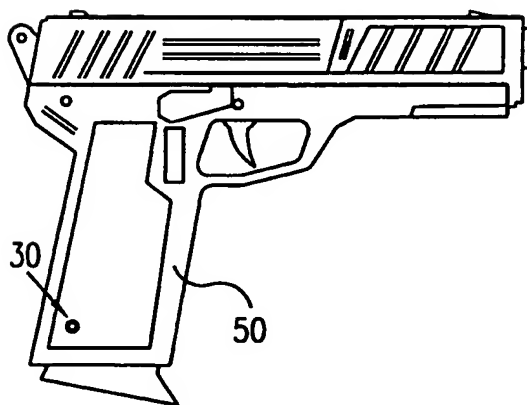


FIG. 13

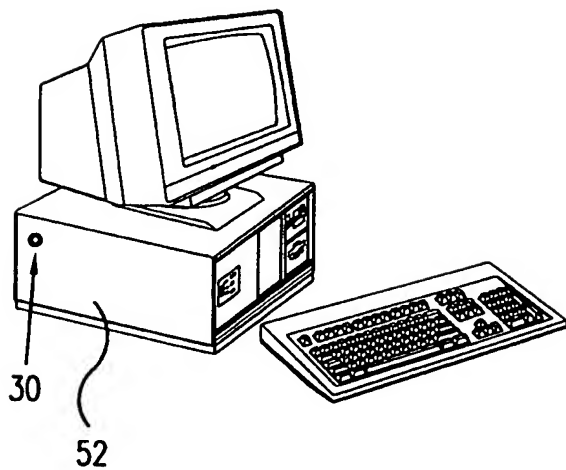
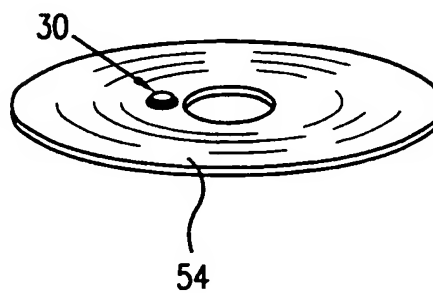


FIG. 14



INTERNATIONAL SEARCH REPORT

International application No.

PCT/IL00/00253

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G06K 7/10, 19/06

US CL : 235/462.030

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 235/462.030, 375, 462.01, 462.13, 487, 491, 492, 493; 125/30.01; 219/121.68

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

USPAT, DERWENT, EPO, JPO

search terms: gem, gemstone, jewelry, jewel, precious stone, diamond, ring, id, identification, embed, recess, insert, inscribe, engrave, etch

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4,931,629 A (Frankfurt) 05 June 1990 (05/06/1990), figures 1-4, col. 2, lines 14-42.	1-7
Y	US 5,932,119 A (Kaplan et al) 03 August 1999 (03/08/1999), figure 13D, col. 7, lines 38-44, col. 25, lines 60-67, col. 26, lines 1-19.	1-4, 6, 7
Y	US 4,707,592 A (Ware) 17 November 1987 (17/11/1987), col. 2, lines 31-38.	5, 10, 11, 13
X	US 5,677,521 A (Garrou) 14 October 1997 (14/10/1997), figures 1, 3, 4, 6-9, col. 3, lines 34-67, col. 4, lines 1-38, 50-53, col. 5, lines 2-13.	8, 9, 12, 14-16
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Y		10, 11, 13



Further documents are listed in the continuation of Box C.



See patent family annex.

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document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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document member of the same patent family

Date of the actual completion of the international search

16 AUGUST 2000

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/IL00/00253

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4,392,476 A (Gresser et al) 12 July 1983 (12/07/1983), col. 8, lines 16-26.	7
A	JP 1-305495 A (Asai et al) 08 December 1989 (08/12/1989), abstract, constitution.	1-16